

# San Francisco Bay Conservation and Development Commission

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October 31, 2018

**TO:** All Engineering Criteria Review Board Members

**FROM:** Lawrence J. Goldzband, Executive Director (415/352-3653; [larry.goldzband@bcdc.ca.gov](mailto:larry.goldzband@bcdc.ca.gov))  
Rafael Montes, Senior Staff Engineer (415/352-3670; [rafael.montes@bcdc.ca.gov](mailto:rafael.montes@bcdc.ca.gov))

**SUBJECT: Draft Minutes of September 26, BCDC Engineering Criteria Review Board Meeting**

1. **Call to Order.** Todd Hallenbeck, GIS Team Member, introduced the Bay Shoreline Flood Explorer website; it makes sea level rise and flood maps available. An in-depth demonstration and training are to follow.

Brian Lewis, Brickyard Cove Alliance for Responsible Development, commented on the Richmond project. He expressed concern about the performance standard differences between the liquefaction remediation and the environmental remediation regarding the slurry wall. Chair Borchardt stated that a response from the ECRB could be made only by formal request from the BCDC.

The meeting was called to order by the Chair, Dr. Roger Borchardt, at approximately 1:08 p.m. in the Monterey Conference Room at 455 Golden Gate Avenue, San Francisco, California.

Audience members interested in the first project included the following: Cleve Livingston, Project Manager of the Latitude Terminal One project; Jeff Fippin, ENGEO; Sam Yao, SGH; Susan Hubbard, Brickyard Cove Alliance for Responsible Development or BCARD; Mark Bryner, architect and civil engineer; and Mark Burry, local homeowner.

Audience members interested in the second project included the following: Bill Kennedy, Catellus Development Corporation; Damir Priskich, Catellus Development Corporation; Gayle Johnson, SGH; Justin Reynolds, SGH; Haze Rodgers, Langan Engineering; Kathleen Livermore, City of Alameda; Stephen Dickenson, New Albion Geotechnical; Doug Schwarm, Atlas Geotechnical; Jonathan Nasr, Atlas Geotechnical; and Juan Baez, Advanced Geosolutions, Inc.

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State of California | Edmund G. Brown — Governor



**ECRB MINUTES**  
**September 26, 2018**

BCDC Staff Members present were: Rafael Montes, Senior Staff Engineer and Board Secretary; Rebecca Coates-Maloon, Principal Permit Analyst; Todd Hallenbeck, GIS Team Member; Andrea Gaffney, Bay Development Design Analyst; Shannon Fiala, Planning Manager; Ethan Lavine, Chief of Bay Resources and Permits; Erik Buehmann, Chief of Federal Consistency and Permits and Morgan Chow, Permit Analyst.

The following Board Members were present: Dr. Roger Borchardt, Board Chair; Robert “Bob” Battalio, PE; Richard B. Dornhelm, PE; James “Jim” French, PE, GE; William Holmes, SE; and Professor Jack Moehle.

The following Board Members were not present: Professor Mary Catherine Comerio; Professor Martin Fischer; Lou Gilpin, PhD, CEG, and Frank Rollo, PE, GE.

**2. Approval of Draft Minutes of November 1, 2017 Engineering Criteria Review Board (ECRB) Meeting.** Chair Borchardt asked for a Motion and a Second to adopt the Minutes of November 1, 2017.

**MOTION:** Mr. Dornhelm moved approval of the Minutes, seconded by Mr. Dornhelm. Mr. Dornhelm noted that he had erroneously been marked absent.

**VOTE:** The motion carried with a vote of 5-0-0 with

Chair Borchardt, Mr. Battalio, Mr. Dornhelm, Mr. Holmes, and Mr. Moehle voting “YES”, no “NO” votes, and no abstentions.

**3. Public Announcements.** There were no public announcements.

**4. Board Discussion: Latitude Mixed-Use Redevelopment Project, Contra Costa County (Pre-Application).** Chair Borchardt explained the issues that had been brought before the Board and stated that the applicant had responded to them. He presented the Board’s comments.

Regarding the favorable response to the DSMs, Chair Borchardt asked about the existing deep foundations on which the building was supported in conjunction with the deep soil mixing around it. Mr. Fippin answered that the foundations had helped in the performance of the structure. However, there are no case studies in which only piles are driven in a liquefiable soil and the effects of liquefaction are reduced. In this case, the amount of deep soil mixing combined with the piles to produce the result.

Chair Borchardt stated that Board Member French had asked about de-aggregation of the hazards at the site. The applicant had provided a response. Mr. Montes advised that the ECRB could accept the response without needing a vote; the Board agreed.

Chair Borchardt stated that Board Member Rollo had wanted to see criteria upon which the contractors would bid on the DSMs; the applicant had provided that criteria.

Chair Borchardt stated that an issue had been raised regarding changing the site class from E to F because of liquefaction potential. The applicant had provided a response. Chair Borchardt asked the applicant’s estimate for the fundamental period for the site, assuming that no liquefaction took place. Mr. Fippin answered that the analysis showed zero period – PGS – for the ground, while the site response analysis, which accounts for the softening of the soil due to liquefaction, had a fundamental period of close to 0.7 seconds.

Chair Borchardt had calculated that the fundamental period for the site would be between 0.6 and 0.8 seconds, and the fundamental period of the wharf would be in the same area. Amplification of the ground motion is going to be highest near that period, so what is the impact on the wharf considering that its fundamental period is in the same area? Also, since they are relatively short periods, what is the likely impact with respect to the piles? Mr. Fippin responded that their time/history analysis of the site response inclusive of the soft soil at the site showed that the peak value of the resulting spectra is very close to the fundamental period of the structure. Mr. Yao explained the non-linear analysis.

Chair Borchardt noted Board Member Holmes' comment regarding monitoring the information in the disclosures of the future inspection program for the de-aggregation of the piles. Board Member Holmes deemed the applicant's response to be acceptable.

Chair Borchardt stated that the ninth item concerned repairing some of the piles in the major damage category. The applicant's response was deemed sufficient by the Board.

The applicant had also responded to the seismic stability evaluation question that had been raised. It was deemed acceptable, as was the response to the issue of the seeming inconsistency between the stated streaks.

Chair Borchardt concluded that the applicant's responses to the issues raised by the Board were adequate and acceptable.

**5. Board Discussion: Alameda Landing Mixed-Use Development Project, Alameda County (Pre-Application).** Ms. Coates-Maldoon opened with a briefing on the project. The current proposal was reviewed by BCDC's Design Review Board on July 9, 2018 and will be returning to the DRB on October 15. The project is in pre-application with BCDC. Staff anticipates receiving a formal permit application in the near future.

Ms. Coates-Maldoon stated that the Staff Report lays out a series of questions for the Board's consideration regarding the engineering criteria of the proposed project:

- a. Whether the DSM would be effective in preventing major damage or failure of the wharf, and whether the no-collapse design goal would be sufficient to ensure the permanency of the wharf.
- b. Whether the wharf can remain functional or be repairable after damage from a major earthquake.
- c. Whether an ongoing pile monitoring and repair program would ensure the permanency of the wharf.
- d. Whether the piles should be repaired or replaced prior to use of the wharf for public access.
- e. What the potential adverse effects to the wharf would be from sea level rise, and appropriate measures for resiliency and application.
- f. Whether the estimates of flooding relative to the wharf are appropriate based on the state guidance, and whether frequent flooding of the wharf would render it unusable.

The project proponents presented additional information to the Board.

Mr. Kennedy began the 54-page slide presentation in order to provide answers to the six questions. He described the layout of the project.

Mr. Rodgers stated that Langan Engineering and Environmental Services had done geotechnical consulting for Catellus. He reviewed a sketch of the subsurface conditions. The site is generally blanketed by fill that was brought in for past use. Below the fill is up to 30 feet of bay mud; below that is a medium-dense sand layer, then very dense sands and clay layers. Geotechnically speaking, the primary issues are liquefaction of the fill and the medium-dense sand below the bay mud, as well as settlement of the bay mud due to the weight of the fill, and soil stability of the waterfront out into the channel.

Mr. Rodgers stated that many strategies were considered for stabilization of the wharf including structural and onshore improvement.

Mr. Johnson stated that SGH had done seismic analysis, inspection, etc. in the past year and a half which he would be presenting. SGH had set its overall design philosophy, consistent with California Building Code ASCE 7 as non-collapse in the MCE event.

To get people off the wharf in an MCE event, there will be several egress points along the length of the wharf into the residential area; SGH is contemplating a sliding ramp that will move with the wharf.

The wharf will not be a public assembly point where thousands of people gather; it will be a pedestrian promenade, so the governing criteria goes to the Alterations section of the California Existing Building Code or CEBC. It is not treated as a new structure. For lateral loads, SGH compares the demand-capacity ratio of the before-and-after cases; if less than a 10% increase, you are grandfathered in. SGH is still checking the structure for non-collapse.

The basis of design is the Maximum Credible Event or MCE per ASCE 7 as a load. For structural analysis SGH got soil movements from the ground improvement contractor, Advanced Geotechnical Solutions, Inc or AGI. Site-specific shaking hazards were developed by Atlas and New Albion. Pushover analyses were done per ASCE 61. Performance criteria for strain limits are defined for Life Safety Protection, which is more stringent than Collapse Prevention. Load combinations include 100% plus 30% orthogonal. For the first check SGH combined 100% inertial plus 100% kinematic.

For the existing condition, a 100% underwater and above water inspection was done by following the ASCE practice for underwater inspection. 2,041 piles were inspected and most damage was found in the splash zone. The proposal from SGH is to repair 190 major and severe plumb piles.

The other major repair item is the deck soffit which will be more cosmetic than structural.

Board Member French asked what had caused the damage. Mr. Johnson answered that it may have been different quality controls on different concrete batches from the manufacturers with chemical deterioration coming through cracks in the concrete allowing water to corrode the rebar – bay salts on steel. Chlorides within the concrete mixes can accelerate this.

Mr. Johnson continued that because of railroad tracks and crane rails there is redundancy in the number of piles in the structure, so the structure has extra capacity.

Chair Borchardt asked the reason for reducing the width of the wharf. Mr. Kennedy answered that the real threat to the structural integrity of the project is not the wharf itself but the lateral displacement of the soils acting upon the wharf. The project will get in behind the riprap as close to the edge as possible and do the soil improvement to stabilize it. Mr. Johnson mentioned that it is very unusual to have land extending under the deck; the wharf is almost a pile-supported platform.

Chair Borchardt asked what removal of part of the wharf does to the strength of the wharf and its ability to resist lateral movement. He also asked about the impact of deep soil mixing – soil remediation – on the remaining wharf. Mr. Johnson replied that those questions would be answered in the presentation.

Mr. Johnson explained details of the pile restoration and also explained rebar repair.

He explained the geotechnical profiles of the three main sections of the wharf, and the section that would be cut. He explained differences in the decks.

He showed a typical SAP model of the piles.

He explained the kinematic and inertial analysis of deck displacement for an 88' cut (the worst of the two soil types).

Mr. Johnson showed scale factors of 1 and 8 for deformed shape at target displacement for 88' Cut at Section D – Kinematic + Inertial (Seaward). The simulation showed no rotation at the deck – people would not be launched into the water.

He showed photos of damage under the deck from earthquakes in Ecuador and Turkey in which the structures remained standing.

He confirmed for Board Member Dornhelm that the batter piles are ignored – they are the first to go anyway. They are the stiffest elements because they were put there for the mooring, so they always will attract the most load. They will fail in shear and tension especially with reversing loads. They do not do anything to the deck (which is being monitored at every step). We would not repair batter piles after an earthquake.

Mr. Johnson summarized the seismic analysis.

Regarding seismic instrumentation, Mr. Johnson stated that SGH had talked to Moh Huang of the California Strong Motion Instrumentation Program (CSMIP). Mr. Huang is helping with the design of the seismic instrumentation; it will probably take around six months to get everything in place.

The proposal from SGH is to place instruments at the eastern side of the wharf at two locations with a set of instruments on each end of the angled portion. Mr. Johnson added that this area is fairly well-instrumented because of the Webster Street tube.

Chair Borchardt asked the overall length of the structure; the reply from an audience member (perhaps from Damir Priskich) was 1,435 feet. Chair Borchardt expressed concerns from a ground motion point of view about the weight passage effect and differences in the site response beneath the structure; both could impart different loads on the structure. Chair Borchardt recommended doing some calculations on differences in acceleration from one end to the other. He felt that surface waves are prominent in this kind of situation, and asked about differential forces imparted on the structure.

Chair Borchardt mentioned the geometry of the structure – there may be a need for some joints to accommodate the differential in displacements. Mr. Johnson replied that when they were looking at the eastern end, they were more concerned with kinematic than inertial loads. They looked at how much differential kinematic movement the structure could withstand, and there was some capacity for different amounts of kinematic movement in different parts of the structure – different accelerations causing different amounts of spreading.

Dr. Dickenson interpreted the question with respect to wave passage and a displacement demand because of the wave passage that is additive to their kinematic loading which is from a soil permanent displacement demand. SGH has taken records from Loma Prieta at Berths 24 and 25 at the Port of Oakland, and they had looked at displacement time histories in SAP (a civil engineering software for designing a mathematical model of, and mechanically analyzing civil structures), to look at additional load in the piles because of the wave passage. Because of the isolation joints, shear joints, and inherent flexibility of these long structures, he said it didn't add enough load.

Chair Borchardt recommended coming up with the numbers and putting them together for a longer duration, higher magnitude earthquake.

He commented on the importance of having instrumentation at the other end of the structure in order to understand the response to the densified soil matrix fills and the remediation that is going to take place. The motions on the wharf and on the soil are going to be quite different.

Mr. Kennedy pointed out that they were present for the wharf structure; there is another development application for whatever is going to be built in tract. He emphasized that it had taken five years to come up with a project that is viable, because of the cost to rehabilitate this land environmentally, geotechnically, and structurally. They would need to trade something out to compensate for any additional cost to the project.

Mr. Johnson said that he would work with Mr. Huang to see about costs.

Board Member Moehle referred to the issue of wave passage effect on forces on the deck. He imagined that due to wave passage, 500 piles pull to the south while 500 pull to the north, and down the middle of the deck there isn't enough capacity for the pull. He suggested for someone to do calculation of the wave passage deformation.

Dr. Baez stated that the role of Advanced Geosolutions, Inc. in the project is to take the site characterization performed by Langan and the structural requirements from SGH, and come up with ground motions for a particular sea level event, and to optimize the soil reinforcement in order to provide the project kinematic load associated with displacements that were under certain criteria. AGI had worked in conjunction with the sub-consultants Atlas Geotech and New Albion. Dr. Dickenson had developed the ground motions and performed the 1D site response analysis. AGI then internally performed 2D finite element analysis using PLAXIS, taking into account the ground motions at the top of the old bay mud and then incorporating the various geometries, properties, and parameters particular to the project. The resulting reports have been reviewed by the sub-consultants as well as SGH and Langan.

To strengthen the soil and reduce the kinematic load on the piles on the wharf, they settled on cement deep soil mixing. One of the advantages of this technology is that you can create various geometries with it. It has been around for many years. Dr. Baez cited other sites that use this technology.

They found two main geotechnical conditions for the wharf which they termed Section D and Section F. They performed a number of pile load tests that included pile integrity tests, static compression load tests, and pile dynamic load tests throughout the wharf.

Board Member French and Dr. Baez discussed the reasons for piles being damaged below ground surface.

Dr. Dickenson discussed the selection of ground motions and the site response. He stated that ground motion characterization was done per ASCE 7-05. They used a 1D site response model, nonlinear, DMOD 2000 (a computer program for seismic response analysis), running it in total stress mode.

Dr. Dickenson gave the 1D analysis. He emphasized that they were primarily interested in the period range for this project, which is the predominant period of the wharf. That could be 1 to 1-1/2 seconds; that was where they evaluated how much the soil amplification you get in motion. A graph showed the ratio of the spectral acceleration at a given period between the depth of interest (at the top of the old bay clay – the base of the PLAXIS model) as a ratio over the bedrock. It displayed how many times as a factor that the motions of the depth of interest were magnified over what they were amplified from rock. The peak was about 3.2 seconds.

Dr. Dickenson stated that New Albion provided the spectral shapes to SGH, as well as acceleration time histories and displacement time histories.

Dr. Dickenson provided clarification to Chair Borchardt on the graph. Chair Borchardt suggested to use a different term than  $V_{s,30}$  (shear-wave velocity).

Dr. Baez stated that AGI received the time histories, which were fed into a finite element model. He showed a graph displaying variation of properties, load conditions, and geotechnical conditions, in order to optimize the mitigation program and to develop displacement profiles for SGH.

Dr. Baez showed 2D numerical models of the wharf at four locations that included the piles, then an illustration of one of the ground motions at the four locations that showed the contours of displacement. He showed a summary example of the displacement in the Section D model. Another graph showed the variation of soil deformation versus distance from the wharf edge. The final illustration showed the retained wharf and soils improvement area with the remaining Raymond piles and 16-inch concrete piles. Dr. Baez noted that the analysis takes into account that they will need the improvement in the upper layer with the densification via rapid impact compaction.

Mr. Kennedy stated that the City of Alameda has established criteria for sea level rise based on the Alameda Point Project. He explained the data SGH had compiled.

Board Member Battalio asked about the criteria for sea level rise and base flood elevation: were they applied specifically to the public pile-supported structure, or was SGH using the same design criteria for the livable spaces? Mr. Kennedy answered that this project was the public promenade and the infrastructure. FEMA's design criteria for the other structures was more restrictive.

Board Member Battalio asked if this was a regular A zone or a coastal A zone. They might want to check that for wave crest elevations. Mr. Kennedy answered that the criteria they had started out with was a little more restrictive than what the staff had recommended in the 2018 guidance. The 2100-year event is a hard one, and the probability of that happening is not high, so SGH often solves for a 50-year or 100-year event. The 50-year event is much more predictable now than the 100-year event.

Regarding the public access structure, Board Member Battalio felt it important when looking at the state guidance to consider the type of use in selecting the risk aversion level. If it is a public access facility, perhaps the low-risk aversion curve is the correct one. He referred to Attachment C in the BKF report, which is from the state guidance. If the criteria is for housing, the high risk aversion level should be used.

Board Member Dornhelm agreed that public access may have a different requirement than the other types of improvements that could go along the shoreline which would define the medium high or high risk. We should be aware that the public access is going to be a permanent improvement, and that in the past we have used the high estimate of 36 inches to the 50-year account level. This gives somewhat of a concession because we are using better data and more appropriate technique. Going forward, this will then become a criteria that will probably be used; BCDC wants to be sure of giving appropriate guidance to potential future applications.



Board Member Holmes pointed out that the public access aspect is not triggering any structural high risk level – public access is not considered a critical structure. Board Member Battalio noted that the housing, which is just inland, should be at the high risk level (although not in ECRB purview under review). Mr. Lavine stated that BCDC will be looking for public access that will be adaptable and usable until the end of the century.

Board Member Battalio noted that they had been discussing the 100-year water level, which is infrequent. For an operational setting, they might consider using what some of the national risk studies are using: spring tide water levels. The idea is that when that elevation rises to the point where it starts to inundate an area, twice a month inundation is frequent enough that it might affect land use. Spring tides are the highest tide range every two weeks.

Mr. Kennedy expressed the hope that the ECRB would consider that this is an existing structure; before the City of Alameda and Catellus took an interest, that structure was going to continue in disuse, not being used for public access.

Chair Borchardt asked at what design stage they considered the project to be at this point. Mr. Kennedy answered that it was at the local approval stage. Catellus was looking for positive feedback from the ECRB as they submit the formal package. Mr. Kennedy mentioned that the package will include the floating dock off the main promenade.

Chair Borchardt commented on the issue that considerable fill will be put in place for the structures; what would the thickness be? Mr. Kennedy responded that the finished grade will be above the deck level, will continue to rise up, and will eventually drop back down.

Chair Borchardt stated that the placement of that fill will cause lateral movement of the bay mud. Mr. Rodgers explained that Warehouse 1, the existing structure, will receive the most fill 7 – 8 feet. This will cause significant issues in stability, building performance, and seismic performance. To reduce the impact, they have recommended that lightweight fill (cellular concrete) be used below Warehouse 1. It will be above tidal influence in the water table. A retaining wall will be used.

Board Member French noted that with cellular concrete, if you have walls around it you must pay attention when it rains – it can cause transient buoyancy. Make sure there is good drainage.

Mr. Rodgers stated that the 2D PLAXIS modeling done by AGI considered normal weight fill – a heavier material than what they will be putting in.

Board Member French expressed concern about the buoyancy of cellular concrete. Mr. Kennedy described how Catellus had successfully constructed buildings in bay mud bowls using lightweight fill.

Board Member French offered some comments.

- In the Langan report, Figure 1 and Figure 2 show different shapes for the project.

- When waves come under a deck, especially with sea level rise, will there be uplift impact from the momentum of waves? Mr. Reynolds answered that much of what we deal with is wake from vessels. SGH came up with a 1 foot high wave, resulting in about 55 PSF of load. Board Member Battalio commented that boat waves are coherent: when they hit the back of something they can trap air. Mr. Reynolds described an isolation joint put in by the City of Alameda. Mr. Priskich related an idea that where specific areas of the wharf are damaged, they could be turned into a feature with no grading, just a railing, leaving the piles in place.
- With high tide being used for the storm drain, Board Member Battalio sought to confirm that sea level rise was being considered with storm drainage.

At this point Chair Borchardt announced that a quorum was present; he asked what kind of action BCDC was looking for. Mr. Montes answered that if the ECRB felt the criteria were sufficient to move forward, BCDC would accept that. If the ECRB felt that further development of the criteria was necessary, BCDC would accept that recommendation too.

Chair Borchardt felt it would be beneficial to address the following issues:

- The impact of lateral movement of the fill associated with the bay mud, and its impact on the wharf.
- Displacements induced by wave passage effect.
- MCE time histories appropriate for the Hayward Fault and the San Andreas Fault.
- The possibility of having another instrument on the west end of the wharf, and two additional locations on the densified soil matrix zone.
- The definition of  $V_{s30}$ . Chair Borchardt suggested identifying the interval, using instead  $V_{s30-100}$  (meters). Dr. Dickerson acknowledged that this change would not materially change the results of any of the analyses they had performed.
- The ECRB had not seen a plan for the DSM. It is going to be a densified remediation zone to improve the soil response, right next to the wharf. How is it going to be affected by the lateral movement of the bay mud beneath it or close to it, and what is going to be the effect of the lateral movement on the wharf?
- Identification of the correct inundation zone.
- Buoyancy of the cellular concrete.

Board Member French commented on the slope stability analysis looking at PLAXIS with the DSM; they used a composite at strength value. Was there any possibility for the material between the DSM panels to ooze out? Dr. Baez answered that they have addressed that. In fact, for design purposes they are ignoring the contribution from the material between the DSM shear panels even though they will have some residual strength that helps with the overall strength. There is no significant movement of that material between the panels.

Board Member French commented that Mr. Johnson's tally of damaged piles did not include an estimate of the number of damaged piles at depth below grade. Mr. Johnson stated that they are not part of the final structure. Dr. Baez stated that those piles are going to be freed up at the surface – they will not contribute to the stabilization of the wharf itself; that is why they are ignored.

Board Member French asked if pit tests were done on the piles out over the wharf, would some be damaged at depth? Mr. Johnson answered that only the Raymond piles were damaged. He confirmed that most of the damage was near the splash zone; they looked for damage from being in the marine environment. Below the mud line there is no longer any oxygen so there won't be that kind of damage. Dr. Baez added that where they had found damage particularly on the east side (which was around 20 feet), in the Raymond piles behind the wharf, those depths come underneath the wharf. That elevation will not project itself under the deck that will remain later on.

Board Member French cautioned about having cement spillage into the bay during construction for the pH environmental impact.

He had the same caution for surcharging wick-drains – they are pretty close – be aware of controlling environmental runoff and siltation towards the bay.

He appreciated that the review interchange had gone back and forth between Langan and New Albion.

Mr. Kennedy summarized that the Board's feedback had generally been about conditions. He appreciated the advice the Board had given. Very shortly Catellus expected to sign an agreement with the homebuilder where their due diligence period will be finished. Catellus' application is going in during the next week, and they hoped that the next steps will be progressive rather than backward. Some of the Board's questions had answers which could be packaged as responses to some of the conditions, allowing Catellus to move forward. Chair Borchardt was amendable.

Chair Borchardt sought clarification that "the project" meant the wharf, cutting it down, and removing part of the structure. Mr. Kennedy affirmed.

Chair Borchardt asked where the soil remediation portion of the project came in. Discussion ensued; Mr. Kennedy stated that the buildings are a minimum of 100 feet back from the face of the wharf. Mr. Lavine stated that staff needed advice on the question of whether the fill in the bay resulting from this project is safe.

He suggested a way of thinking about how to proceed in terms of if and when the project comes back to the ECRB.

Think of three buckets: (1) staff has the assurance to go to the Commission and say that the Board believes that the fill is safe. If there is a fundamental question there, the answer might be that this project needs to come back to the ECRB before going to the Commission; (2) there may be no fundamental question, but there are additional criteria that the Board needs to see in some intermediary stage before staff provides Catellus with the go-ahead to build. The Board could go back to post-issuance of a permit; and (3) the Board could give direction to staff on what to look out for when they review materials.

Chair Borchardt suggested for Catellus to provide the Board with written responses to the issues brought up. The Board would then provide a consensus on acceptance of the responses or suggestions for additional things that might be helpful. The Board's suggestions are meant to be helpful to the applicant and to ensure that development on the bay – addition of fills, whether man-made or soil – are safe.

Chair Borchardt felt that the area of soil remediation and its impacts needed more time. Those issues can be addressed in writing.

Mr. Montes stated that Board acceptance of written comments would have to be done in a public forum.

Ms. Coates-Maloon stated that staff would like more clarification regarding the pile repair and placement program, in particular whether the piles should be repaired or replaced prior to use of the wharf for public access. It is a critical question to consider in the project timing.

Board Member Holmes had understood that with the piles put in several different categories of damage, the most severely damaged ones would be repaired before public access.

Mr. Johnson stated that with the extent of damage present now, they had not seen any safety concerns. As structural engineers they would not limit access.

Board Member French stated that Catellus was following appropriate criteria; without the ECRB checking their individual calculations we could say that their approach is reasonable.

Board Member Holmes asked about the damaged piles in the analysis. Mr. Reynolds explained that they had either neglected the extra piles, or said that they are going to be strengthened in the repair scheme. Mr. Johnson said that for the MCE, they did not put in a weakened pile. The first round of repairs will have more than enough piles that cover their entire model. Mr. Kennedy said that they did not perceive this as an issue. They were required through their phasing in terms of occupancies and completed homes, to open up the eastern portion of the promenade first and have that available. Catellus could accommodate doing the pile repairs in that section first.

Mr. Kennedy commented on the environmental work with DTSC: it involves determining where any remediation needs to be done. Catellus understands the (Water) Regional Board's concern regarding impacts of using chloride and soil materials close to the water. That remediation is nowhere near what they had to do on the rest of the project.

Chair Borchardt stated that the Motion should be to recommend that the applicant move forward on the project, with the issues identified by the Board to be addressed in writing for Board review at a future meeting.

Mr. Montes asked if those fundamental questions regarding the criteria would impede the applicant in going before the Commission. Chair Borchardt answered that the issues can be addressed after the applicant goes to the Commission. Staff and Chair Borchardt continued to discuss the procedure they should use.

Chair Borchardt asked the Board which issues they considered significant enough not to move forward with the project; the only one he considered as such was the plan for the DSM and the environmental impacts. Board Member French stated that he did not feel the need to look at that again. Board Member Dornhelm stated that he had none, and that the Board was committing now to a low risk aversion category for public access.

Board Member French commented that they had not further discussed the question of what happens to the bulging of the bay mud underneath when you load the surcharge on – whether that impinges on any piles nearby. He suggested for the Board to provide a criteria for the applicant to address that explicitly and for Mr. Montes to review it.

Mr. Lavine referred to the point of low risk aversion for public access. The state provides different ways to look at it. Fundamentally, staff needs to approve a risk category that is resilient to flooding from sea level rise at mid-century, and it must be adaptable until the end of the century; or an alternative has to be provided.

Board Member Battalio agreed that staff could evaluate that; adaptive capacity and maintaining the public access function is a reasonable description and staff could work out the details with the applicant.

Board Member Moehle stated that there were no items that he saw the need to review again. He did not feel that the existing piles and repair were a safety issue at this point.

**MOTION:** Mr. Moehle moved that these listed items be put in writing and delivered to the team for review and response by BCDC staff without coming back to the Board; seconded by Board Member French.

**VOTE:** The motion carried with a vote of 6-0-0 with Chair Borchardt, Mr. Battalio, Mr. Dornhelm, Mr. French, Mr. Holmes, and Mr. Moehle voting “YES”, no “NO” votes, and no abstentions.

6. **Adjournment.** There being no further old or new business, the meeting was adjourned at 4:27 p.m.